United States Environmental Protection Agency

Climate Resilience Evaluation and Awareness Tool

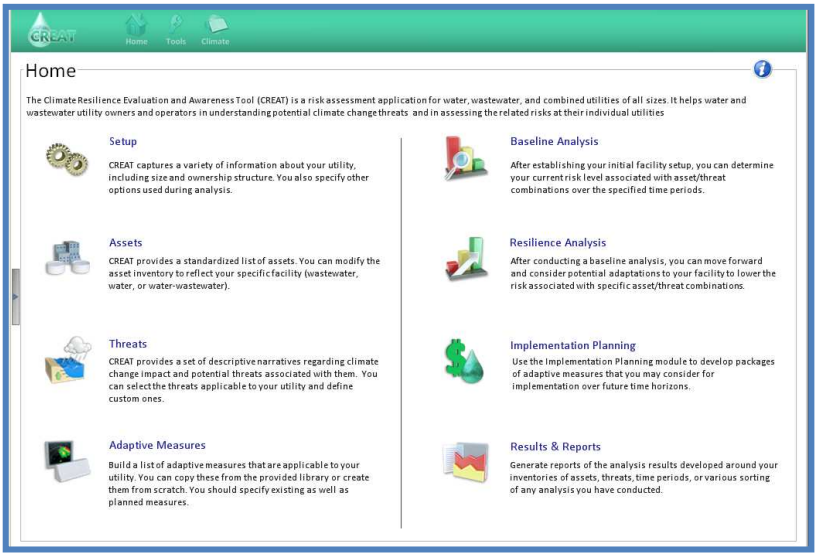
Purpose

Climate change impacts pose a challenge to the ability of the Nation's drinking water and wastewater systems (water sector) to fulfill their public health and environmental mission. Extreme weather events, sea level rise, shifting precipitation and runoff patterns, temperature changes, and resulting changes in water quality and availability all have potentially significant implications on water utility operations.

EPA has developed the Climate Resilience Evaluation and Awareness Tool (CREAT) software to assist drinking water and wastewater utility owners and operators in assessing their risk to potential climate change impacts. CREAT uses the most current scientific understanding of climate change to increase drinking water and wastewater utility owners and operators' awareness of potential impacts to utility operations and missions by assessing climate change impacts and consequences.

Features

- Serves as a stand-alone risk assessment product that raises utility awareness of the potential impacts of climate change and assesses the implementation of climate change adaptation options and their effectiveness in reducing risk to climate change impacts;
- Contains climate change information at regional and local levels to support the assessment of the likelihood of threats and potential asset, environmental, community, and economic consequences;



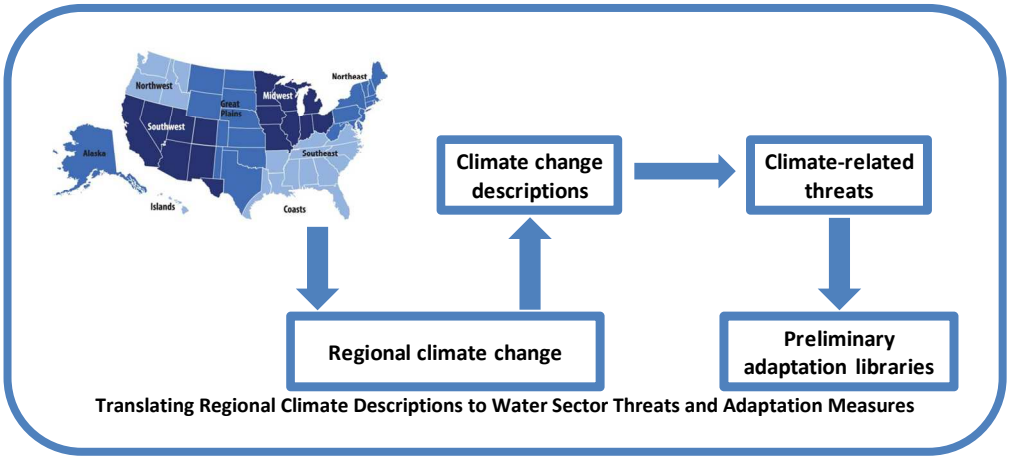
Home screen that includes an overview of all steps in the CREAT process

- Supplies a library of drinking water and wastewater utility assets (e.g., water resources, treatment plants, reservoirs, distribution system components, pump stations) that could be impacted by climate change;
- Lists climate change impacts (e.g., sea-level rise, precipitation changes, and reduced snow pack) expected to affect drinking water and wastewater utilities and highlights differences in regional climate change projections;
- Provides suggested customizable adaptation strategies that can be implemented at the user's utility;
- Generates a series of risk-reduction and cost reports that allow the user to evaluate various adaptation options; and
- Evolves over time as new information and research become available, enabling the implementation of effective adaptation strategies in the future.

Process: Adaptation, Planning, and Use

Water sector utility owners and operators use information about their utility to identify climate change threats, assess potential consequences, and evaluate adaptation options in CREAT. This approach allows utilities to assess impacts based on established thresholds where asset or mission failure would occur. Users can also consider existing climate science data to evaluate the plausibility of climate-related impacts and how soon these impacts may affect the utility. CREAT also supports utilities in initiating adaptation planning despite the uncertainties in magnitude and direction of projected climate change.

Individual utilities can use regional projections to analyze climate change and understand related impacts. CREAT does not attempt to model or forecast climate change (e.g., temperature and precipitation changes). Instead, a framework has been incorporated into the tool for using available qualitative regional and quantitative (downscaled) local climate information as part of the utility planning process. Regional climate change projections have been translated into climate-related impact scenarios and a preliminary set of adaptation measures (see image below). For example, the threat of floods from high flow events would be influenced by any projected changes in winter hydrology, precipitation, storm intensity, and storm frequency. Building on the awareness of how climate change can impact a utility's assets, users are guided through a process to determine risks with and without adaptation options over multiple time periods. Users are able to evaluate the risk reduction attributed to different adaptation options as well as the associated costs.



Translating Regional Climate Descriptions to Water Sector Threats and Adaptation Measures

The water sector should consider climate change in its planning, engineering, and management decisions regardless of the uncertain timing, location, and scale of future climate impacts. For some utilities, it is not an option to "wait and see" or "take no action." The current stock of capital assets and any new investments will be impacted by climate change even if the effects cannot yet be precisely predicted. The water sector can use the approach CREAT employs to understand and evaluate potential adaptation measures. This approach complements existing tools used to make projections or assessments regarding utility management (e.g., models of hydrology, urbanization, and demand).

CREAT helps utilities to organize and communicate climate-related activities and information to decision makers, stakeholders, and citizens. This function builds confidence that the utility is being appropriately proactive while identifying gaps or areas where additional funding or planning may be needed.

Contact

CREAT is available for download at http://water.epa.gov/infrastructure/watersecurity/climate/creat.cfm. For more information on CREAT, contact Curt Baranowski of EPA at baranowski.curt@epa.gov.